

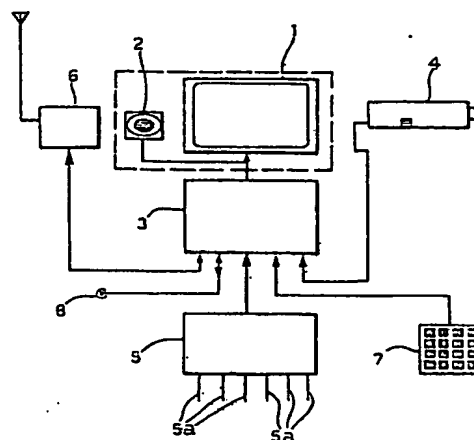
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**I-10121 Torino (IT)**㉙ **Comprehensive monitoring system for the drivers' cabs of tractors.**

㉚ A comprehensive monitoring system for the drivers' cabs of tractors, comprising a television display (1) with a loud-speaker (2), a tuning-detection-colour matrix-audio-video control unit (6), a television camera (4), an interface and conditioning unit (5) arranged to receive input signals from sensors installed on the tractor, a mixing and processing unit (3) connected between the television display and the interface and conditioning unit and connected to the control unit and to the television camera, and a control unit and to the television camera, and a control keyboard (7) connected to the processing unit.



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## Description

### Comprehensive monitoring system for the drivers' cabs of tractors.

The subject of the present invention is a comprehensive monitoring system for the drivers' cabs of tractors.

The system is characterised in that it comprises:

- a display, normally of television type, provided with a loudspeaker,
- a tuning-detection colour matrix-audio-video control unit controllable by serial means and also provided with tuning-detection for radio-television transmitters,
- one or more television cameras, possibly orientable, adapted for installation on the tractor in a rearward-looking position and possibly provided with remote controls (focusing, zoom, etc.),
- an interface and conditioning unit arranged to receive input signals from sensors and detectors installed on the tractor,
- a mixing and processing unit connected between the television display and the interface and conditioning unit and connected to the control unit and the television camera, and
- a control keyboard connected to the processing unit.

Preferably, the system also includes an audio-video recorder (video disc, video cassette, etc.) connected to the processing unit.

The comprehensive monitoring system according to the invention makes available to the operator of the tractor, in a direct and convenient manner, a plurality of functions which may be summarised as follows:

- instrumentation
  - . interactive electronic dashboard
  - . check panel
  - . performance monitor
  - . diagnostics
  - . exchange of controls and data between operators and electronically controlled equipment;
- rearward vision
  - . detailed/panoramic vision of the working area
  - . detailed/panoramic vision of the positioning of equipment;
- entertainment and instruction
  - . reception from radio-television transmitters
  - . video-cassette recording (also with operating instructions).

The invention will now be described in more detail with reference to the appended drawing, provided purely by way of non-limiting example, which shows in diagrammatic form the layout of the comprehensive monitoring system for drivers' cabs of tractors according to the invention.

With reference to the drawing, the system according to the invention includes a black-and-white or colour TRC-type monitor 1 with an associated loudspeaker 2, both installed in the driver's cab of a tractor in a position where they can easily be seen by the driver. The monitor 1 is conveniently provided with a 6-10" diagonal medium-resolution screen and is suitable both for the reproduction of television pictures and for the reproduction of graphic sym-

bols.

The monitor 1 is connected to an electronic processing unit 3 arranged to receive, in the manner explained below, signals to be processed according to one or more predetermined programs, and to display the results in the form of images and audio signals by means of the monitor 1 and the loudspeaker 2. In particular, the processor 3 is able to fulfil the functions of processing and mixing of signals, generation of symbols and alpha-numeric messages, organisation of priorities, supervision and diagnostics.

The signals sent to the processor 3 come from a television camera 4, from an interface and conditioning unit 5, from a control unit 6, and from a control keyboard 7.

The television camera 4, which may be black-and-white or colour, is of the remotely orientable type and possibly provided with automatic or remote-controlled focusing or zoom. It is arranged for installation in the rear region of the vehicle for detailed or panoramic cover of the working area and/or of the positioning of the equipment attached to the rear of the tractor.

The interface and conditioning unit 5 is provided with a series of inputs 5a connected to sensors, detectors and any other processing unit on the tractor, and is arranged normally to acquire the following classes of input signals:

- on-off signals, earthed or at +12V
- 0-5/0-12V earthed analogue signals;
- differential analogue signals, 0-1 V/O-12V;
- preformed pulse signals-0-10 KHz TTL levels from phonic wheels, variable-reluctance sensors;
- line or lines for connection to transported equipment provided with electronics.

The control unit 6 is constituted by a tuning-detection-colour matrix-audio-video unit controllable by serial means (remote control channel) through the processor 3. It is also provided with electronics for amplification, selection, and detection of audio and video signals in black-and-white or colour, broadcast by electromagnetic wave transmitters, for example, AM/FM radio stations and/or television transmitters.

The control keyboard 7 may be of conventional push-button type or of the "Touch screen" type, or even a cursor control of the "Track ball" or "Joystick" type, etc.

The processing unit 3 is also provided with a socket 8 for possible connection of a video cassette recorder.

By virtue of the above-described conformation, the monitoring system according to the invention is able to fulfil the following main functions:

- instrumentation
  - . interactive electronic dashboard
  - . check panel
  - . performance monitor
  - . diagnostics
  - . exchange of control and data between the operator

and electronically controlled equipment;

- rearward vision  
 . detailed/panoramic vision of the working area .  
 detailed/panoramic vision of the positioning of  
 equipment;

- entertainment and instruction

. reception of television transmissions  
 . video cassette recording, also with operating  
 instructions.

It is possible to present several classes of  
 information simultaneously, for example, superim-  
 posed on part of the screen (windowing), etc.. In the  
 case of conflicting demands, the central processor  
 organises the display priority. This occurs according  
 to prearranged preceding levels so as to ensure  
 signalling appropriate to the importance of the  
 event.

## Claims

1. A comprehensive monitoring system for  
 drivers' cabs and for tractors, characterised in  
 that it comprises:

- an image display (1) provided with a loud-  
 speaker (2).  
 - a tuning-detection-colour matrix-audio-video  
 control unit controllable by serial means and

also provided with tuning-detection control for  
 radio-television transmitters,

- at least one television camera (4), possibly  
 orientable, adapted for installation on the  
 tractor in a rearward-looking position and  
 possibly provided with remote controls,

- an interface and conditioning unit (5) arranged  
 to receive input signals from sensors and  
 detectors installed on the tractor, the interface  
 unit being further provided with input/output  
 communications with any equipment attached  
 to the tractor,

- a signal processing and mixing unit (3)  
 connected between the television display (1)  
 and the interface and conditioning unit (5) and  
 connected to the control unit (6) and the  
 television camera (4),

- a control keyboard (7) operatively connected  
 to the processing and mixing unit (3).

2. A system according to Claim 1, charac-  
 terised in that it also includes an audio-video  
 recorder (8) connected to the processing and  
 mixing unit (3).

3. A system according to Claim 1 or Claim 2,  
 characterised in that the processing unit (3) is  
 arranged to present information on the display  
 (1) according to a hierarchical system of  
 prearranged precedence levels.

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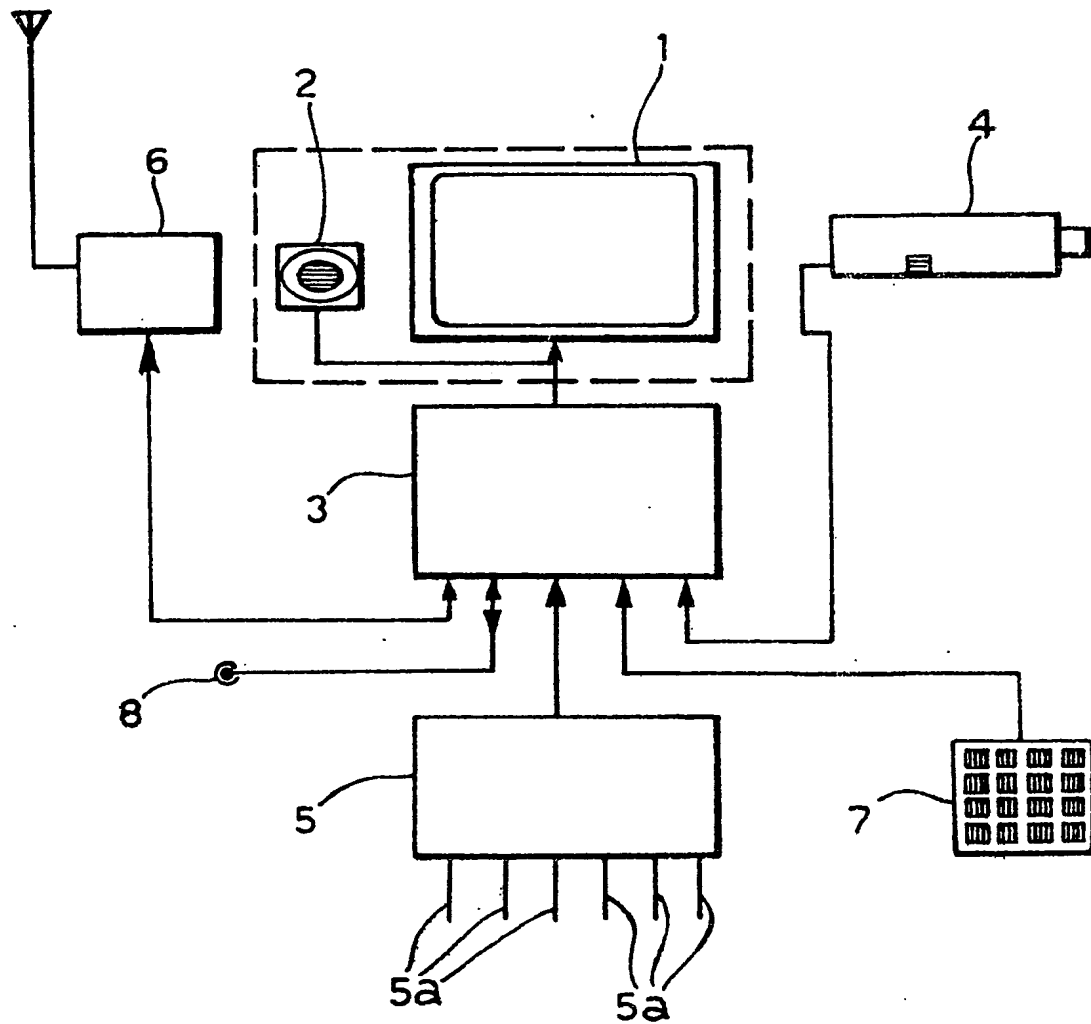
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European Patent  
Office

## EUROPEAN SEARCH REPORT

Application Number

EP 88 83 0442

DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int. Cl.4)
Y	DE-A-1 555 360 (FENDT & CO.) * Claims 1-4; figures 1-3 *	1	B 60 R 1/00 B 60 R 11/02
A	---	2,4	
Y	WO-A-8 404 499 (ERNST) * Pages 1-2; figure 1 *	1	
A	---	2,4	
A	DE-A-2 223 816 (NIPPON DENSO K.K.) * Page 3, line 7 - page 5, line 13; figure 1 *	1-3	
A	GB-A-2 144 682 (JACOBS) * Page 1, lines 5-23; figure 2 *	1-3	
A	FR-A-2 465 612 (SANTENERO) * Page 2, lines 20-29; figures 1-3 *	1	
			TECHNICAL FIELDS SEARCHED (Int. Cl.4)
			B 60 R H 04 N
The present search report has been drawn up for all claims			
Place of search THE HAGUE		Date of completion of the search 25-01-1989	Examiner MAUSSER, T.
CATEGORY OF CITED DOCUMENTS			
X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document		T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date. D : document cited in the application L : document cited for other reasons ----- & : member of the same patent family, corresponding document	

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